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HAZARD RECOGNITION AND CONTROL

9. LOCKOUT/TAGOUT

1.0 Purpose

To establish the program, process and responsibilities for hazardous energy isolation and control of machines, systems and equipment to ensure protection of personnel working within the scope described below and under the standards of 29 CFR 1910.147, Control of Hazardous Energy; 29 CFR 1910.333, Selection and Use Of Work Practices; and 29 CFR 1910.335, Safeguards for Personnel Protection.

In addition, this program establishes the requirements for the proper isolation and control of systems in regards to nuclear safety, nuclear criticality safety and hazardous materials. In cases of permanent decommissioning or isolation, the procedures of the Site Conduct of Operations Manual (COOP) should be followed subsequent to the use of this procedure.

Appendix 1, Self Audit Checklist for Lockout/Tagout is a checklist that can be used to measure compliance with the requirements of this program.

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## **2.0 Scope**

This program covers installation, verification, working within the boundaries of, and removal of Lockout/Tagouts (LO/TOs), Lockouts (LOs) and Tagouts (TOs) at the Site. This is the Site energy isolation program, as provided for in 29 CFR 1910.147, .333 and .335, with the addition of construction and demolition activities. This program is also structured to include the Site's isolation requirements associated with nuclear safety, nuclear criticality safety and hazardous materials, as supported by the Site COOP.

Isolations to be performed under Section 5.0, Minor Maintenance or Preventive Maintenance (MM/PM) Isolations are those that the controlling organization has determined can be safely executed on Minor Maintenance or Preventive Maintenance (MM/PM) tasks requiring single point, single shift isolation. Isolations performed under Section 5.0 are used for systems that are classified by the Conduct of Engineering Manual (COEM) as System Category 4. LO/TOs shall be completed in accordance with Section 4.0 for all other system categories.

Utility clearances implemented by outside contractors or utility companies within the boundaries of the service easement must follow their own procedures.

This program applies to all Site contractor employees and subcontractors. No one shall operate or attempt to operate LO/TO or TO isolated equipment (except as required to perform an effectiveness check per Section 4.0 of this program), including but not limited to valves, breakers, switches or systems (isolated by means such as blind flanges or blocking devices) that are under LO/TO or TO control.

## **3.0 Safety Requirements**

An overview of the LO/TO process is provided in Appendix 2, LO/TO Process Flowchart.

### **3.1 Double Valve Isolation/Double Barrier Isolation**

NOTE: LO/TO is not required for changing out compressed gas cylinders.

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Double valve/barrier isolation is required when one or more of the following conditions exist:

- System contains a cryogenic substance (except dewars).
- System contains compressed air, gas or vapor exceeding 30 psig and/or a temperature exceeding 120°F.
- System contains a liquid with a pressure exceeding 90 psig and/or a temperature exceeding 120°F.
- When required by criticality safety engineering.
- When mandated by a facility authorization basis.

Double valve/barrier isolation points shall be developed based on a walkdown from the isolation point(s) to the work location. When double valve/barrier isolation is required, a system sketch or single line drawing shall be developed based on the system walkdown. This drawing shall be approved by the controlling organization and attached to the LTP. If available, engineering drawings shall be used, provided they have been field verified by the LTM. Drawings are to clearly indicate all system equipment, valves, associated interconnected systems and LO/TO or TO isolations. The LTM shall verify the LO/TO isolation points by walking down the system.

If double valve/barrier isolation is required but is unattainable or not feasible, as determined by the controlling organization, then work with single valve/barrier isolation may be authorized provided the following conditions are met:

- **Approval Authority:**  
In nuclear facilities, work approval authority and responsibility is vested in the senior line manager responsible for the proposed activity. This individual can then delegate signature authority as follows:
  - Facility manager is the minimum approval authority in nuclear facilities.
  - Project manager is the minimum approval authority level for projects where the project manager, not a facility manager, controls the work.

For non-nuclear facilities and operations, work approval authority shall be as follows:

- For areas or operations with a facility or project manager, the facility manager shall be the approval authority unless the work involves a project where the project manager, not the facility manager, controls the work in which case the project manager would be the approval authority.

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- For areas or operations with no designated facility or project manager (such as with many Site services landlord buildings), approval authority rests with the senior line manager responsible for the proposed activity.

NOTE: At printing the current list of Category 2/3 nuclear facilities included 371, 374, 440, 559, 569, 664, 707, 750 pads, 771, 774, 776, 777, 779, 881, 886, 904 pads, 906 and 991.

The authorization shall be documented in the work control document(s).

- All walkdown, sketch and field verification requirements for double valve/barrier isolation are met.
- Single valve isolation is verified to be effective and adequate, as determined by the LTM.

### 3.2 When Lockout/Tagout or Tagout Is Required

This LO/TO or TO program shall be followed whenever employees could be exposed to hazardous energy sources, hazards associated with nuclear systems and/or hazardous materials or the unexpected energization of systems or equipment. LO/TO or TO is also used to prevent accidents involving radioactive or hazardous materials and to maintain the building safety envelope for worker, public and environmental protection. Only authorized employees are allowed to perform LO/TO or TO.

Application of LO/TO, LO or TO shall be job or task specific, requiring separate lock(s) and/or tag(s) applied to each energy isolation device regardless of existing isolations. This may require the use of multiple lock(s) and multi-lock hasps on energy isolation devices to ensure the integrity of each separate isolation since work and associated LO/TOs or TOs may be completed and removed at different times.

This program shall be used to prohibit operation of systems or equipment in the following applications:

- Missing, defective or ineffective protective devices (i.e., guards, shields, interlocks)
- Installation
- Repair
- Maintenance/servicing (such as MM/PM, Section 5.0)
- Construction and demolition activities
- During physical removal of equipment

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- Other conditions potentially presenting danger

### 3.3 When Lockout/Tagout or Tagout Is Not Required

- Unless required by the work control document(s), live electrical systems or components that operate at less than 50 volts to ground, are not required to be LO/TO or TO if there will be no increased exposure to electrical hazards. An example of increased exposure to electrical hazards is a high amperage battery bank operating at less than 50 volts where severe and explosive arcing could occur in short circuit conditions.
- For work on cord- and plug-connected electric equipment for which exposure to the hazards of unexpected energization, startup of the equipment, or release of hazardous energy is controlled by unplugging the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance. The plug is under the exclusive control of the employee when either of the following conditions prevails:
  - The plug is physically in the possession of the employee.
  - The plug is within arms reach and in the line of sight of the employee.
- For specifically exempted electrical systems or work per Chapter 36, Electrical Safety Program (Section 5.6, Energized Electrical Work). Every attempt shall be made to de-energize equipment prior to conducting work.
- For work on a domestic water line operating at less than 120°F, if the isolation device is under the immediate control of the employee performing the servicing or maintenance. The isolation device is under the immediate control of the employee if it is within the immediate work area and in line of sight of the employee.
- For minor tool changes or adjustments, when the on-off and/or isolation switch is within arms reach of and under the exclusive control of the operator. This exception is intended for machine shop tool operations only.
- For relamping activities.
- Changeout of compressed gas cylinders.

### 4.0 Implementing a LO/TO or TO

If an energy isolation device is capable of being locked out, then LO/TO must be used. All exceptions must be approved by the controlling organization.

TOs alone shall only be used when it is not feasible to use locks and employees involved with the TO are aware of the following tag limitations.

- Tags do not provide a positive restraint like a lock.

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- Tags may give a false sense of security and their meaning needs to be completely understood in order to be effective.
- Tags must be legible.
- Tags must be able to withstand the environment.
- Tags must be securely attached to the isolation device.
- Tags are never to be removed without authorization.

**4.1 LO/TO or TO Request**

Any Site employee (affected employee/worker) or subcontractor may request a LO/TO or TO, or the request is established by an appropriate work control document(s) (Section 8.37). The requester contacts the LTM assigned to the building, area, system or project, requests the application of LO/TO or TO and explains why it is needed.

**4.2 LO/TO Manager (LTM)**

NOTE: The LTM cannot be the verifier or isolator on the same LTP.

The LTM of the controlling organization is responsible for ensuring completion of the LTP (see Appendix 3) and tags by a trained and knowledgeable person (authorized employee). A trained and knowledgeable person other than the LTM who fills out the LTP shall verify through drawings, written LO/TO or TO procedures for specific equipment, visual inspection of the system (walkdown) or other work control documents that the isolation proposed is complete and accurate. Entries on tags shall be completed legibly using black ink.

The LTM in charge of the LO/TO or TO for the affected system/equipment shall review the completed LTP and tags, and verify through drawings, visual inspection of the system (walkdown) or other work control documents that the isolation proposed is complete and accurate.

If the equipment is operating, the equipment must be shut down by the applicable operations procedure before the LO/TO or TO is applied. Residual energy must be relieved, restrained and checked as described by the operating procedure.

If a TO alone is to be employed, the affected employees shall be made aware of the six TO limitations listed above in Section 4.0 through a pre-evolution briefing.

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- Ensure the work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, the applicable work control document(s) (such as IWCP) and individual facility requirements (including the Plan of the Day).

NOTE: The work control document(s) (such as IWCP), as it applies to energy isolations, establishes the control boundaries and documents all information necessary for a successful application of LO/TO or TO. At a minimum, the work control document(s) shall include the following:

- Specific procedural steps for shutting down, isolating, blocking and securing the machine or equipment to control hazardous energy.
  - Specific procedural steps for the placement, removal and transfer of lockout devices and tags and who is responsible for them.
  - Specific procedural steps for testing the machine or equipment to determine the effectiveness of lockout devices and other energy control measures.
  - Specific procedural steps for restoring the machine or equipment to service.
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- Ensure that locks are used in conjunction with tags in all cases where equipment or component configuration allows.
  - Ensure the information on the tags is identical to that on the LTP.
  - Complete necessary documentation on the LO/TO Permit Log.
  - Inform affected employees and subcontractors (where applicable) before LO/TO or TO controls are applied, by describing the scope, hazards and limitations involved in LO/TO or TO.
  - Prior to the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained or otherwise rendered safe. If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.
  - Issue tag(s), lock(s), key(s) and multi-lock hasp(s) or lockbox, as appropriate, along with a working copy of the LTP, to the isolator. In addition, the LTM shall ensure that the isolator has the applicable work control document(s) for this evolution. A multi-lock hasp is required for use with a PCL. The isolator and verifier may operate

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together to hang and then verify the LO/TO or TO as long as the independence of the two is maintained per this LO/TO program.

- At shift change, ensure that oncoming LTM(s) and affected employees are made aware of the current status of LO/TO or TO.

#### 4.3 **LO/TO or TO Placement – The Isolator**

NOTE 1: The isolator cannot be the verifier or LTM on the same LTP.

NOTE 2: If the equipment is operating, the equipment must be shut down by the applicable operations procedure. Residual energy must be relieved, restrained and checked as described by the operating procedure.

NOTE 3: The isolator and verifier may operate together to hang and then verify the LO/TO or TO as long as the independence of the two is maintained per this LO/TO program.

- Position the energy isolation device(s) per the approved LTP.
- As long as the system does not affect other components or release hazardous material, physically evaluate the equipment to ensure that the energy isolation device(s) (valve, switch, etc.) is properly placed and works in a satisfactory manner.
- For a TO only installation, a tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lockout (i.e., removal of an isolating circuit element, removal of a valve handle, opening of an extra disconnecting device, blocking of a controlling switch or the use of lockwire to disable a valve handle). This additional measure(s) shall be documented on the LTP.
- Install the tag(s), either directly attaching the tag(s) to the lock(s) or by means of a self-locking, non-releasable tie (having the general design and basic characteristics of being at least equivalent to a one piece, all environment tolerant nylon cable tie) at least the strength of 50 pounds. Lock(s) and multi-lock hasp(s) shall be installed on the device(s) described on the LTP. Where a tag cannot be affixed directly to the energy isolation device(s), the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device (i.e., fastened to cover the device).

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- As long as the component is locked out, physically manipulate the equipment controls inside the boundaries of the LO/TO or TO, not the energy isolation device(s).
- Ensure the integrity of the isolation.

NOTE 1: A qualified electrical worker shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed to verify that the circuit elements and equipment parts are de-energized. Before testing, the test equipment shall be checked to ensure it is set in the proper range. Test equipment shall be checked for proper operation immediately before and after this verification. Checks shall be made for energized conditions that result from induced voltage, unrelated feedback voltage and/or circuit imbalance carried by neutral conductors in multi-wire branch circuits. Hazardous, stored or residual energy which might endanger personnel shall be blocked or relieved (see Chapter 36).

NOTE 2: If work must be accomplished on energized systems per Chapter 36, first determine which systems require LO/TO or TO (see Section 3.2).

- Sign and date the tag(s).
- Initial, date and record time on the working copy of the LTP for each lock and tag applied.
- Return key(s) and the working copy of the LTP to the LTM or get the LTMs preapproval to keep the LTP and key(s) at the worksite and have the verifier then perform verification (this process precludes repeated CA entries and is used for short term, one shift work).
- Initial, date and record time on the original LTP for each lock and tag applied upon return of the working copy of the LTP to the LTM.

NOTE: If the working copy of the LTP becomes radiologically contaminated or is damaged during the isolation process, the LTM shall provide another working copy. The isolator must fill out all pertinent information on the new working copy.

### **4.4 LO/TO or TO Verification – The Verifier**

NOTE 1: The verifier cannot be the isolator or LTM on the same LTP.

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NOTE 2: The verifier and isolator may operate together to hang and then verify the LO/TO or TO as long as the independence of the two is maintained per this LO/TO program.

The verifier shall ensure that the system/equipment has been isolated properly by checking that the isolation devices have been properly positioned, ensuring hazardous energy sources have been isolated, testing for proper isolation by using the guidance in Appendix 4, Verifiers Guidelines for Testing Lockout/Tagouts, and ensuring the proper installation of the tags and locks in accordance with the LTP.

- Ensure that no personnel are physically in the area of the equipment, machine or process that is locked out or tagged out who could be affected by unexpected energization due to failure of an isolation.
- Using the guidance in Appendix 4, perform an independent check. This must be done independently. In the event a lockout device obscures the view of the isolation device position, the verification must be completed at the same time as the isolation. The verifier shall ensure the actual component identification (items under LO/TO or TO) match the component required to be LO/TO or TO by the isolator and the component's actual position/condition matches the component's required position/condition after the LO/TO or TO has been performed by the isolator.
- Confirm that each energy isolation device is in the isolation position given by the LTP. If any energy isolation device is not in the required position, or if required LO/TO or TO is omitted, the verifier shall not attempt to operate the device, but shall promptly report the discrepancy to the LTM.
- Document the verification by dating, signing name on tag(s) and initialing the working copy of the LTP.
- Return the working copy of the LTP to the LTM or get the LTMs preapproval to keep the LTP at the worksite and have the LTM approve work conduct by phone (this process precludes repeated CA entries and is used for short term, one shift work).
- Initial the original LTP to indicate that each lock, tag and isolation position has been verified upon return of the working copy of the LTP to the LTM.

#### **4.5 Work Under LO/TO or TO (the Worker)**

- After the LO/TO or TO is in place, the LTM or controlling organization authority will inform the worker and/or his supervisor.
- The worker and his supervisor will discuss the scope and limitations of the LO/TO or TO.

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NOTE: The exception to these steps is discussed in Section 4.3 and 4.4 when preapproval is granted by the LTM to approve work conduct by phone (to preclude repeated CA entries and for short-term one-shift work). The supervisor's responsibility for discussion of LO/TO or TO scope and limitations remains and can be performed before use of this exception.

- Perform an effectiveness check per the applicable work control document(s).
- The worker will check the isolation LO/TO or TO for accuracy and completeness by reviewing the LO/TO or TO sheet and performing a walkdown of the LO/TO or TO to ensure proper placement of tags and positioning of components.
- In the case where the LO/TO worker cannot verify the isolation position due to the lockout device covering the energy isolation device (i.e., valve covered by lockout device), the LO/TO must be removed by the original isolator and re-installed per this practice before work can commence. The LO/TO or TO does not have to be removed if the LO/TO worker was involved with the initial isolation or he has first hand knowledge of the isolation.
- If the worker is not satisfied with the LO/TO or TO isolation, he shall report to the LTM for resolution.
- The work area will be vented (per the applicable work control document(s)) or checked de-energized per Chapter 36 of this manual prior to work beginning.

NOTE 1: For electrical LO/TOs or TOs, a verification of no voltage present shall be performed before work is started on the system or equipment. A qualified electrical worker shall use a volt meter to test the circuit elements and electrical parts of equipment to which employees will be exposed to verify that the circuit elements and equipment parts are de-energized. Before testing, the test equipment shall be checked to ensure it is set in the proper range. Test equipment shall be checked for proper operation immediately before and after this verification. Checks shall be made for energized conditions that result from induced voltage, unrelated feedback voltage and/or circuit imbalance carried by neutral conductors in multi-wire branch circuits. Hazardous, stored or residual energy which might endanger personnel shall be blocked or relieved (see Chapter 36).

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NOTE 2: As long as the component is locked out or tagged out, the worker may physically manipulate the equipment inside the LO/TO or TO boundaries not the isolation device(s).

- Install PCL or PCT.

NOTE 1: PCLs are locks issued to workers by the controlling organization on a permanent basis. The lock has one key that shall not be duplicated, used specifically by workers who are going to work under an existing LO/TO. The worker is responsible for controlling his/her lock and key. For permanent and long term employees, the lock will be green in color with the worker's information (name and employee identification number) engraved or stamped into the body of the lock. For temporary workers, the lock will be green in color with the worker's information visibly and legibly affixed to the body of the lock.

NOTE 2: PCLs are applied to the multi-lock or lock box hasps, not to the primary LO/TO device. PCLs are installed for the duration of the worker's association with tasks which can be completed on a continuous work assignment. This includes all or part of a regular shift or a regular shift plus contiguous overtime. All LO/TOs require the application of PCLs by all workers. No documentation or approval is required to apply or remove a PCL beyond the initial verification to ensure the proposed work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, Plan of the Day (POD), applicable work control document(s) (such as IWCP), individual facility requirements (including the Plan of the Day) and permission is granted for the work by the proper authority within the controlling organization.

NOTE 3: When it is not feasible and/or it is impossible to physically attach multiple PCLs to an energy isolation device, as in the case where the weight of the locks could damage the device, or when situations dictate more than one isolation point to safely isolate the immediate work evolution, a lockbox or equivalent system shall be used. The lockbox or equivalent system should ideally be located in the vicinity of the evolution and shall contain the keys from all locks used in the isolation. The

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isolator shall install a lock on the lockbox and return the key to the LTM (either immediately or at the end of the job).

Individual PCL(s) shall be attached to the lockbox in such a manner that the lockbox may not be accessed until all the PCL(s) are removed.

NOTE 4: PCTs are DANGER tags with the worker's information (name and employee identification number) on the tag. The tags are applied to energy isolation devices when it is not feasible to use locks. LTMs control and issue PCTs to the workers for TO evolutions. The worker returns the PCT to the LTM when the TO evolution is completed. PCTs are installed for the duration of the workers association with tasks which can be completed on a continuous work assignment. This includes all or part of a regular shift or a regular shift plus contiguous overtime. All TOs require the application of PCTs by all workers. No documentation or approval is required to apply or remove a PCT beyond the initial verification to ensure the proposed work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, Plan of the Day (POD), applicable work control document(s) (such as IWCP), individual facility requirements (including the Plan of the Day) and permission is granted for the work by the proper authority within the controlling organization. Where a PCT cannot be affixed directly to the energy isolation device, the PCT shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device (fastened to cover the device).

- Perform work.
- Remove PCL or PCT.

**4.6 Testing, Positioning (in conjunction with testing, troubleshooting and/or calibration), Troubleshooting and Calibration of Equipment that are Under LO/TO or TO**

Removal of LO/TO or TO and re-application associated with testing, positioning, troubleshooting or calibrating equipment shall be performed as follows:

NOTE: Positioning includes changing valve positions in conjunction with testing, troubleshooting and/or calibration.

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- Clear the equipment of unnecessary tools and materials.
- Remove PCLs or PCTs.
- Contact the LTM to have the isolator remove the lock(s) and tag(s) where necessary on the equipment to be operated.
- The isolator shall remove the locks and tags that are necessary to allow for the testing, positioning, troubleshooting or calibration of the equipment.
- Test, position, troubleshoot or calibrate the equipment.
- The isolator shall re-apply LO/TO or TO per Section 4.3 of this program using the lock(s) as on the original LTP. The LTM may issue a sufficient number of copies of the LO/TO or TO tags (extra tags) to permit the planned testing, troubleshooting and/or calibration. This process precludes repeated visits to the LTM by the isolator during this process. Tags that are not used during the testing, troubleshooting and/or calibration, and the original and subsequently used LO/TO or TO tags, shall be returned to and destroyed by the LTM.

NOTE: For testing, positioning, troubleshooting or calibrating equipment, only the initial isolation and final removal needs to be authorized on the LTP, but the LTM must approve the extra tags and the execution of the testing, troubleshooting and/or calibration.

- The verifier shall ensure the LO/TO or TO has been installed correctly per Section 4.4 of this process, following the completion of the testing, positioning, troubleshooting and/or calibration.

NOTE: Equipment being tested, positioned, troubleshot and/or calibrated shall not be left unattended without first re-applying the LO/TO or TO as required on the LTP. This includes all work interruptions, except during emergency building/area evacuations. Failure to comply may result in personnel injury.

- When not testing, troubleshooting and/or calibrating, and before continuing work, the worker(s) shall perform an effectiveness check per Section 4.5 of this program and again install his PCL or PCT.
- The preceding steps shall be repeated as authorized by the LTM until the testing, positioning, troubleshooting or calibrating activities are completed.
- Final removal of LO/TO or TO shall be completed in accordance with Section 4.7 of this practice.

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**4.7 Removing LO/TO or TO/Equipment Restoration**

**LO/TO or TO Removal Authorization**

When the required task has been completed, the original requester requests the removal of the LO/TO or TO by providing the LTM a LO/TO Removal Request form (see Appendix 5). The requester must obtain the LO/TO Worker's initials on the LO/TO Removal Request Form before providing the form to the LTM. If the original requester is not available, the original requester's management can request the removal of the LO/TO or TO by providing the LTM a LO/TO Removal Request form. The original requester's management shall ensure that the original requester is notified of the removal before returning to the performance of work at the Site. The Removal Request form submittal shall occur prior to the LTMs approving the final removal of locks and tags. The LO/TO Removal Request form can be approved by the LTM by phone once the work is complete (this process precludes repeated CA entries and is used for short term, one shift work).

**4.7.1 The LTM SHALL:**

- Authorize removal of the locks and tags by signing the original LTP and providing a copy to the isolator.
- Assign the same person who installed the locks and tags to remove them. If that person is not available, the LTM shall delegate another isolator to remove the tags and locks and shall subsequently notify the unavailable isolator that the tags and locks have been removed.
- Notify the worker that the LO/TO or TO is going to be removed.

NOTE: PCLs and PCTs must be removed prior to the removal of the original LO/TO or TO control(s).

**4.7.2 The isolator SHALL:**

- Before the LO/TO or TO is removed, inspect the work area to ensure that nonessential items have been removed, machine or equipment components are operationally intact and that affected employees have been safely positioned.
- Remove tag(s), lock(s) and locking device(s) listed on the LTP. Remove in order if specified by the LTM or the work control document(s).
- Place each energy isolation device in the position stated on the LO/TO Removal Request form.

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- Return the tag(s), lock(s), key(s) and locking device(s) to the LTM.
- Initial, date and record the time of the removal of each lock and tag on the original LTP.

### 4.7.3 The LTM SHALL:

- Verify return of lock(s), tag(s), permit(s), key(s), other locking device(s) and completed forms.
- Close out the LTP and close out the entry in the LO/TO Permit Log.
- Destroy used tags.
- Notify affected personnel of the removal of LO/TO or TO.

## 4.8 Sample Scenario

A lockout/tagout of a fan is required for preventative maintenance and cleaning within the contamination area (CA) of Building 707. The expected duration of the work is one shift.

**4.8.1** Following the steps of Section 4.0, the LO/TO is requested and a knowledgeable person enters the CA, verifies the drawing accuracy and LO/TO plan for the proposed work. The knowledgeable person exits the CA, fills out the LO/TO permit, gets the LO/TO permit approved by the LTM, and isolator and verifier are assigned to establish the LO/TO. The isolator and verifier enter the CA, establish the LO/TO (hang and verify), exit the CA and return the LTP to the LTM. The LTM informs the LO/TO requestor/worker and/or his supervisor that the LO/TO is installed, the worker and supervisor discuss the scope/limitations of the LO/TO, enter the CA, verify he is satisfied with the LO/TO, install PCL and complete the work. The worker removes his/her PCL and tells the original requester that the work is complete (may or may not exit the CA), the requester provides the LTM or LO/TO Removal Request form, the LO/TO removal is approved, the original isolator is assigned to remove the LO/TO, the isolator enters the CA and removes the LO/TO and then exits the CA to return the tag(s), lock(s), key(s) and locking device(s) to the LTM.

**4.8.2** (Alternative process) The work is known to last one shift or less so following the steps of Section 4.0, the LO/TO is requested and a knowledgeable person enters the CA, verifies the drawing and LO/TO plan, exits the CA, prepares the LO/TO permit, gets the LO/TO permit approved by the LTM, and isolator and verifier are

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assigned to establish the LO/TO. The isolator and/or the verifier is also the worker(s) and they enter the CA, establish the LO/TO (hang and verify), phone from the CA to get permission from the LTM to perform the work (the worker may also have been a third person to the isolator and verifier, and entered the CA with them, again to limit CA crossings). The worker(s) has previously discussed the scope/limitations of the LO/TO with the supervisor, installs his/her PCL and completes the work. The worker(s) removes his/her PCL and informs the original requester and the LTM that the work is complete, gets permission (by phone) of the original requester and LTM to clear the LO/TO, clears the LO/TO, exits the CA and returns the permits, tag(s), lock(s), key(s) and locking device(s) to the LTM.

**5.0 Minor Maintenance or Preventive Maintenance (MM/PM) Isolations**

The purpose of this section is to provide a methodology by which workers can safely perform single point minor maintenance or preventive maintenance (MM/PM) isolations and:

- 1) The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees;
- 2) the machine or equipment has a single energy source which can be readily identified and isolated;
- 3) the isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment;
- 4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- 5) a single lockout device will achieve a locked out condition;
- 6) the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance; and,
- 7) the servicing or maintenance does not create hazards for other employees.

Isolations to be performed under this section are those that the controlling organization has determined can be safely executed on MM/PM tasks requiring single point, single shift isolation. Isolations performed under this section are used for systems that are classified by the COEM as System Category 4 in either nuclear or non-nuclear buildings.

MM/PM isolations shall not be used to isolate systems or equipment using over 480 volts AC (nominal).

For MM/PM isolations, the PIL (blue) lock (no tag required) shall be used in conjunction with PCL(s) (green).

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**5.1 Installing a MM/PM Isolation**

**5.1.1 The LO/TO supervisor SHALL:**

- Ensure the proposed work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, Plan of Day (POD), applicable work control document(s) (such as IWCP), individual facility requirements (including the Plan of the Day) and permission is granted for the work by the proper authority within the controlling organization.
- Determine if the MM/PM is a single point, single shift isolation. If the job will last more than one shift or has multiple isolation points, MM/PM LO/TO shall not be used. One shift can be longer than a standard shift, as extended by overtime.
- If a MM/PM isolation cannot be completed in one shift, the MM/PM isolation shall be removed and a LO/TO shall be installed in accordance with Section 4.0 of this practice.
- Designate an authorized employee to control overall job performance, associated lockout or tagout authority, control work forces and to ensure continuity of protection.
- Issue work control document(s) to the authorized employee.

**5.1.2 The LO/TO supervisor or authorized employee SHALL:**

- Notify affected and surrounding personnel of the impact of the job.

**5.1.3 The authorized employee SHALL:**

- Position the energy isolation device so as to isolate the sole energy source.
- Physically test the equipment to ensure the equipment is isolated.
- Install the PIL (blue) on the energy isolation device, such that the device cannot be repositioned.

NOTE: A qualified electrical worker shall use a volt meter to test the circuit elements and electrical parts of equipment to which employees will be exposed to verify that the circuit elements and equipment parts are de-energized. Before testing, the test equipment shall be checked to ensure it is set in the proper range. Test equipment shall be checked for proper operation

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immediately before and after this verification. Checks shall be made for energized conditions that result from induced voltage, unrelated feedback voltage and/or circuit imbalance carried by neutral conductors in multi-wire branch circuits. Hazardous, stored or residual energy which might endanger personnel shall be blocked or relieved (see Chapter 36).

**5.1.4 The worker SHALL:**

- Physically operate the equipment controls (if possible) to verify the integrity of the isolation.
- If equipment controls do not exist, verify by visual inspection or testing the isolation is in position such that the equipment can not be operated.
- Install PCL (green) on existing PIL (blue) lock.

NOTE 1: PCL operations are discussed in Section 4.5. When it is not feasible and/or it is impossible to physically attach multiple PCLs to an energy isolation device, as in cases where the weight of the locks could damage the device, a lockbox or equivalent system shall be utilized. The lockbox shall contain the key from the isolation lock (PIL). Ideally, the lockbox should be located in the vicinity of the evolution. For MM/PM evolutions, the authorized employees PCL shall be placed on the lockbox and shall be considered the controlling lock on the lockbox. The authorized employees PCL shall be the last lock opened before accessing the enclosed key. The lockbox shall be uniquely identified to the evolution being performed.

NOTE 2: A PCL is not required to be installed by a worker who installed the PIL as an authorized employee.

- Perform work.

**5.2 Removal of a MM/PM Isolation**

**5.2.1 The worker SHALL:**

- Inspect the work area to ensure that:
  - Nonessential items have been removed.
  - System/equipment components are operationally intact.

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- That affected employees have been safely positioned away from the area.
- If applicable, remove PCL (green) from PIL (blue) LO/TO.

NOTE: PILs (blue) will only be removed by the authorized employee and PCLs (green) will only be removed by the worker that installed the PCL (green).

**5.2.2 The authorized employee SHALL:**

- Inspect the work area to ensure that:
  - Nonessential items have been removed.
  - Machine/equipment components are operationally intact.
  - Affected employees have been safely positioned away or removed from the area.
- Verify removal of all PCLs (green) from PIL (blue) LO/TO.
- Remove PIL (blue) and locking device.

NOTE: Removal of any PIL (blue) or PCL (green) by anyone other than the original isolator requires authorization by the LTM and the controlling organization and should only be done when truly necessary, and generally only after the intended reason for the LO/TO is completed. In such cases, the original isolator must be off-Site or be deemed unavailable (by the controlling organization) before removal actions are initiated. The LTM shall ensure that the original isolator is notified of the removal before returning to the performance of work at the Site.

- Return lockout device to the LO/TO supervisor.

**5.2.3 The LO/TO supervisor SHALL:**

- Notify the proper authority in the controlling organization that the work is complete.

**6.0 Discussion and Responsibilities**

**6.1 Controlling Organization (building, facility, project)**

- Control and execute the LO/TO or TO requirements in their facilities, buildings, or on their projects.
- Ensure responsible and trained employees are designated as LTMs, isolators, verifiers and workers.

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- Ensure through appropriate designation and actions of a LTM, that the system/component isolation is complete, accurate and independently verified.
- Take appropriate measures to ensure safety class and safety significant systems (formerly Vital Safety Systems) are not inadvertently challenged or compromised by the application of LO/TO or TO.
- Supply all locks (including PILs and PCLs), tags (including PCTs) and associated hardware to be used by the authorized employee.
- Approve and document the use of single valve isolation within the work control document when double valve/barrier isolation is required but cannot be accomplished (see Section 3.1) for applicable systems.
- Issue/check work control document(s) to authorize evolution(s) requiring LO/TO or TO.
- Maintain the required documentation associated with the LO/TO program.
- Perform self assessments to status the LO/TO program for their facility, building or project and issue a quarterly report to the company LO/TO program administrator.

### 6.2 LO/TO Manager (LTM)

- Execute the requirements of the LO/TO program in his/her areas of assignment and ensure that no tags, locks, improvised or makeshift notes are placed on equipment in lieu of the requirements of the LO/TO program.
- Control issued and unissued LTPs, keys, locks, tags, PCTs and other LO/TO or TO devices.
- Destroy used tags.
- Ensure that all locks, keys and locking devices used for the LO/TO program are secured at all times. Keys shall not be duplicated and shall be kept in a designated and secured location. Only personnel with PILs and PCLs are permitted to have and control the key to his/her lock.
- Review, verify and approve LO/TOs or TOs and approve the removal of a LO/TO or TO for his/her assigned area/systems (this can be done by remote phone request).
- Ensure affected employees are notified before LO/TO is applied and after equipment is placed back into operation.
- Replace locks and tags applied in emergencies by the shift superintendent(s), with his/her own issued locks and tags.
- Ensure all workers have a PCL.

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**6.3 LO/TO Program Administrators**

- Review quarterly self assessment results submitted by the various controlling organizations to identify trends or generic problems, and for documenting the results of this review.
- Request by memo, specific action of the controlling organizations to clarify or improve compliance with this practice.
- Complete an annual assessment and report detailing the state of the company's LO/TO program.

**6.4 LO/TO Supervisor**

- Ensure the proposed work has been properly authorized in accordance with Conduct of Operations, the applicable work control document(s) (such as IWCP) and individual facility requirements.
- Determine if the MM/PM is applicable and can be completed within one shift.
- Issue work control document(s) to the authorized employee and complete the Lockout/Tagout Supervisor's Log.
- Ensure authorized employees performing MM/PM evolutions have a PIL.
- Ensure workers performing MM/PM evolutions have a PCL.

**6.5 Isolator**

- Position the energy isolations devices per the approved LTP for the controlling organization.
- Install or remove controlling organization LO/TOs or TOs as directed by the LTM.
- Test systems and equipment inside the isolation boundaries to ensure the isolation is as directed by the work control document(s).
- Ensure the isolator section of the LTP and any associated tags are properly completed.

**6.6 Verifier**

NOTE: Verification may be performed immediately following completion of the isolation, but verification must provide an independent check from the isolator and ensure the actual identification of the item under LO/TO or TO matches the component required to be LO/TO or TO by the isolator and the components actual position/condition matches the components' required position/condition after the LO/TO or TO has been performed by the isolator.

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- Ensure that the system or equipment has been properly isolated by verifying the position of the isolation devices.
- Ensure the proper installation of locks and tags in accordance with the LTP.
- Promptly report any discrepancies in the position of the isolation device or in the LO/TO or TO installation to the LTM. The authorized independent verifier shall not reposition devices or LO/TO elements to “correct” a deficient LO/TO or TO.
- Ensure the LTP and any associated tags are properly completed. Information on tags shall be identical to that on the LTP.

### 6.7 Worker

- Verify the effectiveness of LO/TO as directed by the work control document(s).
- Install PCL’s or PCT’s in accordance with this practice when working on isolated systems or equipment.

### 6.8 Shift Superintendent

- Implement or facilitate the implementation of LO/TO or TO during emergency situations, when appropriate facility personnel are unavailable.
- Control a supply of locks, tags, LTPs and a LO/TO Permit Log for emergency situations.
- Maintain a LO/TO Permit Log for emergency situations, notify affected and surrounding personnel of the impact of the LO/TO or TO and notify the affected controlling organization of the application of emergency locks and tags in their areas of responsibility. LO/TO or TO removal shall follow standard removal protocol delineated elsewhere in this practice.

## 7.0 **Administrative Requirements**

### 7.1 Fire Protection Systems

The fire department has developed impairment and isolation procedures to facilitate outages and ensure prompt restoration of service for fire fighting services. To control the shutdown, repair, maintenance, servicing, etc. of fire suppression/detection systems, the fire department shall observe the requirements of their procedures.

Fire department personnel are not required to observe the standards of the Site LO/TO program for work or operations with the following items:

- Fire protection water supplies (fire pumps, storage tanks and valves)

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- Fire suppression systems (sprinkler, deluge, halon and dry chemical)
- Fire alarm signal systems (bell and chimes)
- Fire detection systems (smoke, heat and halon)
- Major fire doors (3 hour rated and vault fire doors), heat and smoke vents

Fire department personnel shall control the impairment of systems only at specific points:

- Any work performed on the power leading to an alarm/signaling control panel shall be under the control of plant electricians, alarm technicians or plant power and shall follow this program. The fire department's impairment procedures shall control all energy sources at the point of the alarm panel and downstream.
- Valves controlling water supplies to sprinklers from the point of the Post Indicator Valves (PIVs) and downstream shall be removed from service, observing the standards of the fire department's impairment procedures.
- Repair/replacement of fire hydrants which require excavation of the hydrant or water main shall follow this program.

### **7.2 LO/TO or TO Restrictions, Altering Boundaries and Missing Tags**

The person who discovers that a tag is missing, or has fallen off, shall notify the LTM of the controlling organization. The LTM shall verify the validity of the affected LO/TO entry. If valid, a new tag shall be applied under the same LTP by the original isolator. If not valid, the affected LO/TO entry shall be removed and closed.

Removal of any LO/TO device (including PILs and PCLs) or TO by anyone other than the original isolator requires authorization by the LTM and the controlling organization and should only be done when truly necessary, and generally only after the intended reason for the LO/TO or TO is completed. In such cases, the original isolator must be off Site or be deemed unavailable (by the controlling organization) before removal actions are initiated.

The LTM shall ensure that the original isolator is notified of the removal before returning to the performance of work at the Site.

Any actions which damage active tags, LO/TO devices or energy isolation devices are prohibited.

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No employee shall tamper with the orientation of or change the position of a device under LO/TO or TO.

### 7.3 **LO/TO Permit Log**

The controlling organization, shift superintendent or their designated LTMs shall maintain a LO/TO Permit Log (see Appendix 6). The LO/TO Permit Log shall designate which permits are open or closed and shall provide a master list of all active permits.

The LO/TO Permit Log shall be kept in a centralized location, accessible for review on request, and retained one year after the last closeout. It is then dispositioned in accordance with applicable Site procedures. To facilitate recordkeeping, the LO/TO Permit Log may be consolidated periodically to list only the currently active permits. In such cases, the superseded log shall be annotated to show what entries have been transposed to the new log.

### 7.4 **Corrections to Documentation**

The person who completes the LO/TO Permit, tags and LO/TO Permit Log shall correct written errors by drawing a single line through the error, writing the correct information above or next to the error, initialing and dating in the immediate area of the correction in ink. If necessary, a whole entry may be lined out and a new entry made on the next available space. The use of correction fluid and correction tape are prohibited.

To void an LTP, write "VOID" across the LTP, enter the reason it was voided, and file it with the other closed permits. The voided permit number must be recorded on the LO/TO Permit Log by drawing a single line through the entry and initialing and dating the void in the immediate area of the void.

### 7.5 **Corrective Action On Lockout/Tagout Deficiencies**

Deficiencies noted in LO/TO status shall be reported to the supervisor, who shall, in turn, report the deficiencies to the LTM of the controlling organization.

#### **The supervisor SHALL:**

- Stop all work being performed under the affected LO/TO until the deficient condition is corrected.
- Confirm the adequacy of the corrective action.
- Recommence the work when authorized by the controlling organization.

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### The LTM SHALL:

- Effect corrections by the process steps specified in Section 7.4 or 7.5.

## 7.6 Self Assessments

### 7.6.1 Quarterly Self Assessments

The controlling organization **shall** self assess the status of their portion of their company's LO/TO program by issuing a quarterly report to the company LO/TO program administrator. Document situations where physical access to tags and/or locks is not feasible (for example, "infinity rooms", unauthorized access areas, etc.).

This report shall include the results of a review of :

- At least 25% of the active LO/TOs and associated permits logged as being issued prior to the reporting period, including a walkdown of those locks and tags in the field.
- 100% of the new and still active LO/TOs and associated permits issued during the reporting period including a walkdown of those locks and tags in the field.
- The administrative portion of the self assessment, at a minimum, shall verify the following:
  - All spaces on the LTP are completed properly.
  - The required signatures and initials are in place on the LTP.
  - Personnel listed on the LTP are appropriately trained.
  - When applicable, single line drawings are attached to the LTP.
  - The LO/TO Permit Log is completed properly.
- The field verification portion of the self assessment shall include a visual inspection of locks and tags installed on energy isolation devices to ensure the following:
  - Tags are securely attached to the energy isolation devices and legible.
  - The tag/lock is installed on the correct device.
  - The tag and permit specify the identical isolation position on the device.
  - The energy isolation device is in the position called for on both the tag and the LTP.
  - No sources of hazardous energy have been overlooked.
  - Unauthorized tags, superseded tags or tags for which no records exist are not present.

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Deficiencies noted in implementing the LO/TO program and appropriate corrections shall be documented. Self assessments shall be reviewed for trends or generic problems.

### **7.6.2 Annual Programmatic Field Evaluation**

The implementation of the LO/TO program shall be evaluated annually by the respective LO/TO program administrators. A written report on the status of the program being administered shall be submitted to the Site LO/TO program manager.

This report shall include information pertinent to the status of the program and also documented evidence of the required inspector, employee interactions identified in 29 CFR 1910.147.

Reports shall include at a minimum:

- Number of active LO/TOs.
- All identified deficiencies.
- Trends and generic problems identified by quarterly self assessments as well as resultant corrective actions.
- Suggestions for Site wide programmatic improvement.

### **7.6.3 Annual Programmatic Compliance Review**

The LO/TO program shall be reviewed annually by the LO/TO program manager. This review will consist of a comparison for compliance of the Site LO/TO program with applicable OSHA regulations and DOE Orders. The LO/TO program manager shall detail the results in a written report to the Kaiser-Hill Safety and Industrial Hygiene department.

## **7.7 Personal Controlled Locks (PCLs) and Personal Controlled Tags (PCTs)**

### **7.7.1 Personal Controlled Locks (PCLs)**

PCLs are locks issued to workers by the controlling organization on a permanent basis. The lock has one key that shall not be duplicated, used specifically by workers who are going to work under existing LO/TO. The worker is responsible for controlling his/her lock and key. For permanent and long term employees, the lock will be green in color with the worker's information (name and employee identification number) engraved or stamped into the body of the lock. For temporary workers, the controlling

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organization shall issue the worker a green lock with the worker's information visibly and legibly affixed to the body of the lock.

PCLs are applied to the multi-lock or lock box hasps not to the primary LO/TO device. PCLs are installed for the duration of the workers association with tasks which can be completed on a continuous work assignment. This includes all or part of a regular shift or a regular shift plus contiguous overtime. All LO/TOs require the application of PCLs by all workers (exception: a PCL is not required for MM/PM evolutions when a worker installs his/her own PIL as an authorized employee per Section 7.0 of this program). No documentation or approval is required to apply or remove a PCL beyond the initial verification to ensure the proposed work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, Plan of the Day (POD), applicable work control document(s) (such as IWCP), individual facility requirements (including the Plan of the Day) and permission is granted for the work by the proper authority within the controlling organization.

When it is not feasible and/or it is impossible to physically attach multiple PCLs to an energy isolation device, as in the case where the weight of the locks could damage the device, or when situations dictate more than one isolation point to safely isolate the immediate work evolution, a lockbox or equivalent system shall be used. The lockbox or equivalent system should ideally be located in the vicinity of the evolution and shall contain the keys from all locks used in the isolation. The isolator shall install a lock on the lockbox and return the key to the LTM (either immediately or at the end of the job). Individual PCL(s) shall be attached to the lockbox in such a manner that the lockbox may not be accessed until all the PCL(s) are removed.

### 7.7.2 Personal Controlled Tags (PCTs)

PCTs are DANGER tags with the worker's information (name and employee identification number) on the tag. The tags are applied to energy isolation devices when it is infeasible to use locks. LTMs control and issue PCTs to the workers for TO evolutions. The worker returns the PCT to the LTM when the TO evolution is completed.

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PCTs are installed for the duration of the workers association with tasks which can be completed on a continuous work assignment. This includes all or part of a regular shift or a regular shift plus contiguous overtime. All TOs require the application of PCTs by all workers. No documentation or approval is required to apply or remove a PCT beyond the initial verification to ensure the proposed work has been properly authorized in accordance with the Site Conduct of Operations Manual work control/conduct of work requirements, Plan of the Day (POD), applicable work control document(s) (such as IWCP), individual facility requirements (including the Plan of the Day) and permission is granted for the work by the proper authority within the controlling organization.

Where a PCT cannot be affixed directly to the energy isolation device, the PCT shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device (i.e., fastened to cover the device).

**7.8 Placing Equipment Out of Service**

A piece of equipment or a process may be taken out of service once it has been disabled (i.e., all hazardous energy sources have been relieved and isolated by the physical removal of a power cord, addition of a blind flange, etc.) by using an Information Tag in accordance with MAN-066-COOP. In addition to the requirements of MAN-066-COOP, the tag shall state "Out of Service – Do Not Operate" and the reason the equipment or process was taken out of service in the information block of the tag.

**7.9 Training Requirements**

Refer to the Training Users Manual for training requirements.

**8.0 Terms and Definitions**

All definitions of 29 CFR 1910.147 apply to this program.

**8.1 Additional Safety Measure** - An additional control device, or action taken, to reduce the likelihood of inadvertent energization.

**8.2 Affected Employee** - An employee whose job requires him/her to operate or use machines, systems or equipment on which servicing or maintenance is being performed under LO/TO or TO, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. The affected employee is not required to know how to perform

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LO/TO or TO, but must understand the general requirements of the LO/TO procedure. The affected employee may also be called the worker.

- 8.3 **Authorized Employee** - A trained and knowledgeable employee who implements LO/TO or TO on machines, systems or equipment in order to perform servicing or maintenance on that equipment. An authorized employee and an affected employee may be the same person when the employee's duties also include performing maintenance or service on a machine, system or on equipment which must be locked out or tagged out.
- 8.4 **Capable of Being Locked Out** - An energy isolation device is capable of being locked out if:
- It has a hasp or other means of attachment to which, or through which, a lock can be affixed.
  - It has a locking mechanism built into it.
  - Lockout can be achieved without the need to dismantle, rebuild or replace the energy isolating device or permanently alter its energy control capability (this can be accomplished by using valve or electrical plug lockout devices).
  - The energy isolation device will accept a retrofit lockout device (i.e., valve cover device over a valve hand wheel, commercial lockout device on a ball valve, etc.).

If an energy isolation device is capable of being locked out, then a lockout must be used. All exceptions must be approved by the controlling organization.

- 8.5 **Controlling Organization** - The organization or individual (facility or project manager) responsible for the operation of the building, utility, facility, system or equipment associated with the work to be performed (see Section 4.1).
- 8.6 **Danger Tag** - The LO/TO or TO danger tag is used to identify energy isolation devices and specify their required positions. Use of any other tags for LO/TO or TO is prohibited. The LO/TO or TO danger tag is a 4" X 8" rectangular tag (see Figure 1, Danger Tag) used for all LO/TO or TO applications. When the potential for adverse environmental conditions exists, each tag shall be placed in a plastic locking type bag for protection.

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<p>Tag No. <u>107224</u> LTP No. _____</p> <p><b>DANGER</b></p> <p><b>DO NOT OPERATE</b></p> <p>Approved By: _____ Date _____</p> <p>Isolated By: _____ Date _____</p> <p>Verified By: _____ Date _____</p> <p><b>SEE OTHER SIDE</b></p> <p><small>RF-47252 (Rev. 3/99) Supersedes Previous Issues 40PO 577-117</small></p>	<p><b>DANGER</b></p> <p><b>DO NOT REMOVE THIS TAG</b></p> <p>REASON FOR LOCKOUT/TAGOUT: _____</p> <p>_____</p> <p>DEVICE DESCRIPTION: _____</p> <p>_____</p> <p>ISOLATION POSITION: _____</p> <p><b>SEE OTHER SIDE</b></p>
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FIGURE 1, DANGER TAG

- 8.7 **Energized** - Connected to any potentially hazardous energy source or containing residual or stored potentially hazardous energy or hazardous electrical energy induced from another source.
- 8.8 **Energy Isolation Device** - A mechanical device that physically prevents the transmission or release of energy and/or ensures or prevents operation or change in position or state of equipment necessary to ensure safety. These devices include, but are not limited to disconnect switches, circuit breakers, pump motor disconnects, valves, mechanical blocking devices, free seals and blind flanges.
- 8.9 **Energy Source** - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.

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- 8.10 **Isolation** - Positioning or placement of energy isolation devices to a de-energized state, necessary to ensure protection of personnel from hazardous energy sources.
- 8.11 **Isolator** - An authorized (trained and knowledgeable) employee who physically positions the energy isolation devices and installs lock(s) and/or tag(s). The isolator is selected by the LO/TO Manager (LTM). The isolator cannot be the verifier or the LTM on the same LO/TO Permit (LTP).
- 8.12 **Knowledgeable Person** - A person qualified to operate or work on the equipment being serviced.
- 8.13 **Lockbox** - A device (capable of being locked) in which the key(s) used in various isolations are stored and controlled.
- 8.14 **Lockout (LO)** - The placement of a lockout device on an energy isolating device that ensures the energy isolating device and the equipment or system being controlled cannot be operated until the lockout device is removed.
- 8.15 **Lockout Device** - A device that uses a lock, and singular key, and other mechanical devices such as a chain, hasp or bar secured by a lock and key to secure an energy isolation device in the safe position. Locks are to be used in conjunction with tags in all cases where equipment or component configuration allows. Duplication of keys used for LO/TO is prohibited. Included are blank flanges and bottled slip blinds.
- 8.16 **LO/TO Manager (LTM)** - An employee designated in writing by the controlling organization, who is trained and authorized to review, verify, approve and initiate the installation and removal of tags and/or locks. The LTM cannot be the isolator or verifier on a permit he/she issues.
- 8.17 **LO/TO Permit (LTP)** - A pre-numbered form that allows for administrative control and documentation of the LO/TO process used to isolate an energy source (see Appendix 3, Lockout/Tagout Permit).
- 8.18 **LO/TO Permit Log** - A log that designates which permits are open or closed and provides a master list of all active permits.

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- 8.19 **LO/TO Program Administrators** – An employee responsible for company administration of the LO/TO program and serves as the single point of contact for the Site LO/TO program manager.
- 8.20 **LO/TO Program Manager** - Employee within the Kaiser-Hill Safety and Industrial Hygiene department, responsible for oversight of the Site LO/TO program.
- 8.21 **LO/TO Supervisor** - First line supervisor responsible for supervision of the employee performing isolations for the minor maintenance or preventive maintenance (MM/PM) evolutions. This term applies to MM/PM isolations only.
- 8.22 **LO/TO Worker** - Employee or subcontract employee whose job requires working on systems or equipment isolated and controlled by this LO/TO program. The LO/TO worker may be the affected employee.
- 8.23 **Minor Maintenance or Preventive Maintenance (MM/PM) Isolation** - Minor or preventive maintenance LO/TO which can only be accomplished by a single point isolation and which shall only remain in place one shift. One shift may be longer than a standard shift, as extended by overtime for the same worker or work crew that started the work.

MM/PM isolation is used when: 1) the machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees; 2) the machine or equipment has a single energy source which can be readily identified and isolated; 3) the isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment; 4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance; 5) a single lockout device will achieve a locked out condition; 6) the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance; and, 7) the servicing or maintenance does not create hazards for other employees.

- 8.24 **Minor Tool Change or Adjustment** – Machine shop equipment tooling changes or adjustments which take place during normal production operations, which are determined to be routine, repetitive, or integral to the use of machine shop tools for production (see Section 5.3). For example: changing bits on a drill press or blades on a saw.

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- 8.25 **Non-energy Isolating Devices** - Devices that are not authorized for sole means of energy isolation.. These devices include, but are not limited to check valves, push buttons, selector switches, interlocks and other circuit control devices.
- 8.26 **Normal Production Operations** - The use of a machine or equipment to perform its intended production function.
- 8.27 **Personal Controlled Lock (PCL)**
- For Permanent and Long Term Employees - Permanently issued lock with one key that shall not be duplicated, used specifically by workers who are going to work under an existing LO/TO. This lock shall be affixed to a multi-lock hasp or lockbox by the worker. The lock will be green in color with the worker's information (name and employee identification number) engraved or stamped into the body of the lock.
  - Short Term Issue for Temporary Workers - Lock with one key that shall not be duplicated, used specifically by worker's who are going to work under an existing LO/TO. This lock shall be affixed to a multi-lock hasp or lockbox by the worker. The lock will be green in color with the worker's information visibly and legibly affixed to the body of the lock.
- 8.28 **Personal Controlled Tag (PCT)** - PCTs are DANGER tags (see Figure 2, Personal Controlled Tag (PCT)) with the worker's information (name and employee identification number) on the tag. The tags are applied to energy isolation devices when it is infeasible to use locks. LTMs control and issue PCTs to the workers for TO evolutions. The worker returns the PCT to the LTM when the TO evolution is completed.

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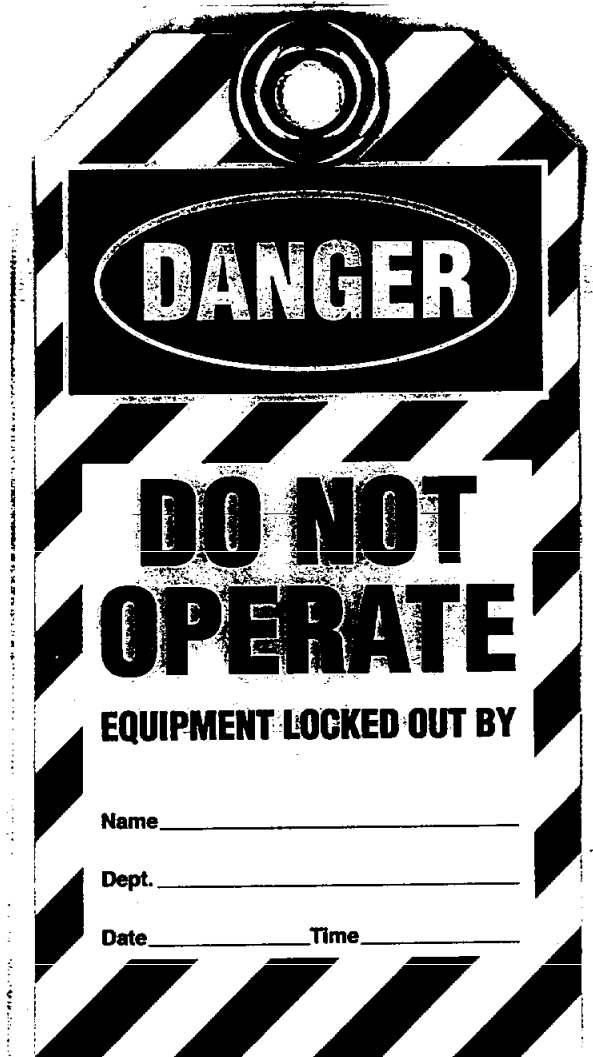


FIGURE 2, PERSONAL CONTROLLED TAG (PCT)

8.29 **Personal Isolation Lock (PIL)**

Permanently issued lock with one key that shall not be duplicated, used specifically for single point, single shift isolation by an authorized employee performing a MM/PM LO/TO evolution. This lock will be blue in color with the worker's information engraved or stamped into the body of the lock. No tag, log entries or paperwork other than that dictated by the work control document(s) is required. Approval for the conduct of the work is required by the LO/TO supervisor.

- 8.30 **Removal of LO/TO** - Act of removing tags and locks from equipment and returning components to normal control and repositioning of isolation devices to the positions given by Appendix 5, LO/TO Removal Request.

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- 8.31 **Requester** - Any company employee or subcontractor having a reason for the application of LO/TO or TO.
- 8.32 **Servicing and/or Maintenance** - Service and maintenance includes, but is not limited to constructing, installing, setting up, adjusting, inspecting, lubricating, modifying, troubleshooting and repairing machines, systems and/or equipment and cleaning or unjamming machines or equipment, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.
- 8.33 **Setting Up** - Any work performed to initially install, modify or prepare a machine or equipment to perform its normal production operation.
- 8.34 **Tagout (TO)** - The placement of a tag on an energy isolating device, in accordance with this program. A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lockout (i.e., removal of an isolating circuit element, removal of a valve handle, opening of an extra disconnecting device, blocking of a controlling switch or the use of lockwire to disable a valve handle). A TO indicates that the energy isolating device and the equipment being controlled may not be operated until the TO is removed.
- 8.35 **Verifier** - Authorized (trained and knowledgeable) employee assigned to verify that LO/TO or TO has been properly implemented. The verifier cannot be the Isolator or the LTM on the same LTP. The verifier shall ensure the actual component identification (items under LO/TO or TO) matches the component required to be LO/TO or TO by the isolator and the component's actual position/condition matches the component's required position/condition after the LO/TO or TO has been performed by the isolator.
- 8.36 **Walkdown** - A field verification of system components and integrity performed to establish the basis for the application of a LO/TO or TO.
- 8.37 **Work Control Document(s)** - Documentation prepared in accordance with the Integrated Work Control Program Manual (MAN-071-IWCP) or a procedure approved by the controlling organization which allows work to progress. This document(s), as it applies to energy isolations, establishes the control boundaries and documents all information necessary for a successful application of LO/TO or TO unless exempted

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per Section 5.0, MM/PM. At a minimum, the work control document(s) shall include the following:

- Specific procedural steps for shutting down, isolating, blocking and securing the machine or equipment to control hazardous energy.
- Specific procedural steps for the placement, removal and transfer of lockout devices and tags and who is responsible for them.
- Specific procedural steps for testing the machine or equipment to determine the effectiveness of lockout devices and other energy control measures.
- Specific procedural steps for restoring the machine or equipment to service.

#### 8.38 Terminology for Isolation Positions

If an energy isolation device has a position indicator, the LTP and Tags shall use the terminology on the position indicator. If an energy isolation device does not have a position indicator the following terms shall be used to describe the isolation position of devices used in the LO/TO or TO:

- Electrical
  - Circuit breakers: On/off
  - Switches: On/off
  - Disconnects: On/off
  - Switch gear: Closed/open
  - Line breakers: Closed/open
  - Tie breakers: Closed/open
  - Fuses: Installed/removed
  - Leads: Connected/disconnected
- Mechanical
  - Valves: Open/shut
  - Relief Valves: Gagged/ungagged
  - Blind Flanges: Installed/removed
  - Springs: Loaded/unloaded
  - Fluid systems: Pressurized/de-pressurized, filled/drained

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9.0 Records

Record Determination	Record Type Determination	Protection/Storage Methods	Processing Instructions
<ul style="list-style-type: none"> <li>Lockout/Tagout Permit</li> <li>LO/TO Removal Request</li> <li>LO/TO Permit Log</li> </ul>	In-process Quality Assurance (QA) Records (Non-WIPP/LL/LLM)	Responsible Manager's shall implement a reasonable level of protection to prevent loss and or degradation. Responsible Manager should define specific protection and storage methods for the document(s), as defined in 1-V41-RM-001. It is recommended that the Responsible Manager work with the Site Records Management organization to assure reasonable controls are being implemented.	Continue prescribed processing of document(s).  Once document(s) is/are complete (authenticated) it shall be handled And controlled as a QA record.
<ul style="list-style-type: none"> <li>Self Audit Checklist for Lockout/Tagout</li> </ul>	Quality Assurance Record (Non-WIPP/LL/LLM)	Responsible Manager's shall implement a reasonable level of protection to prevent loss and or degradation. Responsible Manager should define specific protection and storage methods for the document(s), as defined in 1-V41-RM-001. It is recommended that the Responsible Manager work with the Site Records Management organization to assure reasonable controls are being implemented.	When inactive (as defined in 1-V41-RM-001), transfer to Site Records Management in accordance with 1-V41-RM-001.

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**10.0 References**

Conduct of Engineering Manual  
DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards  
DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities  
MAN-006-COOP, Site Conduct of Operations Manual  
MAN-071-IWCP, Integrated Work Control Program Manual  
PRO-509-CSS, Plant Power Clearance Requirements  
Technical Operations Order OO-UD-65, Plant Power Clearance Requirements  
1-V41-RM-001, Records Management Guidance for Records Sources  
29 CFR 1910.147, Control of Hazardous Energy  
29 CFR 1910.333, Selection and Use of Work Practices  
29 CFR 1910.335, Safeguards for Personnel Protection

**11.0 Attachments**

Appendix 1, Self Audit Checklist for Lockout/Tagout  
Appendix 2, LO/TO Process Flowchart  
Appendix 3, Lockout/Tagout Permit  
Appendix 4, Verifiers Guidelines for Testing LO/TOS  
Appendix 5, LO/TO Removal Request  
Appendix 6, Lockout/Tagout Permit Log

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Self Audit Checklist for Lockout/Tagout

	General	N/A	Complies	Does Not Comply
1.1	Has the LO/TO controlling organization LO/TO program administrators <u>annual programmatic field evaluation</u> been completed?			
1.2	Are controlling organization <u>quarterly self assessments</u> current?			
1.3	Are all spaces on the LTP completed properly?			
1.4	Are the required signatures and initials in place on the LTP?			
1.5	Are personnel listed on the LTP appropriately trained?			
1.6	When applicable, are single line drawings attached to the LTP?			
1.7	Is the LO/TO Permit Log completed properly?			
1.8	Are tags securely attached to the energy isolation devices?			
1.9	Is the tag/lock installed on the correct device?			
1.10	Does the tag and permit specify the identical isolation position on the device?			
1.11	Is the device in the position called for on both the tag and the LTP?			
1.12	Have any sources of hazardous energy been overlooked?			
1.13	Are unauthorized tags, superceded tags or tags for which no records exist present?			
1.14	Do results of the controlling organizations quarterly self assessments detail deficiencies and include corrective actions for those deficiencies?			

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**Self Audit Checklist for Lockout/Tagout**

	<b>General</b>	<b>N/A</b>	<b>Complies</b>	<b>Does Not Comply</b>
1.15	Has the controlling organizations management reviewed their quarterly self assessments for potentially adverse trends and generic problems?			
1.16	Have all personnel received the required training before working within the bounds of the program?			
1.17	Have written reports per Sections 7.7 been submitted?			

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APPENDIX 2

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LO/TO Process Flowchart

<b>1. LO/TO Determination</b>	
a) Is LO/TO required (see Sections 3.2 and 3.3)? <i>If yes, go to 2a.</i>	
<b>2. MM/PM Isolation</b>	
a) Is the isolation to be performed a single point isolation that can be completed in one shift (see Section 5.0)? <i>If yes, go to 2b. If no, go to 3.</i>	
b) Is the isolation to be performed on a system that is classified by the COEM as System Category 4 (see Section 5.0)? <i>If yes, go to 2c. If no, go to 3.</i>	
c) Is the isolation to be performed on a system that operates at 480 volts AC or less (see Section 5.0)? <i>If yes, go to 2A. If no, go to 3.</i>	
<b>A. MM/PM Isolation</b>	
i) The LO/TO Supervisor shall (see Section 5.1):	<ul style="list-style-type: none"><li>• Ensure work has been properly authorized (COOP, POD, IWCP, etc.)</li><li>• Notify affected and surrounding personnel of the impact of the job (notification may be completed by the authorized employee)</li><li>• Issue work control document(s) to the authorized employee</li></ul> <i>When complete, go to 2A(ii).</i>
ii) The authorized employee shall (see Section 5.1):	<ul style="list-style-type: none"><li>• Install their PIL (blue) on the energy isolation device</li><li>• Verify the equipment is isolated</li><li>• If a possible electrical exposure exists, a qualified electrical worker shall use test equipment to verify electrical equipment is de-energized</li></ul> <i>When complete, go to 2A(iii).</i>
iii) The worker shall (see Section 5.1):	<ul style="list-style-type: none"><li>• Verify the equipment is isolated</li><li>• Install their PCL (green) on the multi-lock or lockbox hasp unless they were the employee who installed the PIL (blue)</li><li>• Perform work</li></ul> <i>When complete, go to 2A(iv).</i>
iv) When the work is completed, the worker(s) shall (see Section 5.2):	<ul style="list-style-type: none"><li>• Inspect the work area to ensure that nonessential items have been removed</li><li>• System/equipment components are intact</li><li>• Ensure affected employees have been safely positioned or removed from the area</li><li>• Remove PCL(s)</li><li>• Inform the authorized employee that the work is complete</li></ul> <i>When complete, go to 2A(v).</i>
v) The authorized employee shall (see Section 5.2):	<ul style="list-style-type: none"><li>• Inspect the work area to ensure that nonessential items have been removed</li><li>• System/equipment components are intact</li><li>• Ensure affected employees have been safely positioned or removed from the area</li><li>• Remove PIL</li></ul>

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LO/TO Process Flowchart

<b>3. LO/TO or TO Isolation</b>
a) Is the isolation to be performed on a system that contains compressed air, gas or vapor exceeding 30 psig or 120°F, a fluid with a pressure exceeding 90 psig or 120°F or a cryogenic substance (except dewars) (see Section 3.1)? <i>If yes, go to 3A(i). If no, go to 3B(i).</i>
<b>A. Double Valve/Barrier Isolation</b>
i) The LTM or a trained and knowledgeable person shall walkdown the system to (see Section 3.1): <ul style="list-style-type: none"><li>• Determine isolation points for double valve/barrier isolation</li><li>• Determine the adequacy of applicable drawings</li><li>• Generate a drawing if no drawing exists</li></ul> <i>If double valve/barrier isolation is not possible, go to 3A(ii). If double valve/barrier isolation is possible, go to 3A(iii).</i>
ii) If double valve/barrier isolation is not possible, the LTM shall (see Section 3.1): <ul style="list-style-type: none"><li>• Obtain approval for single valve isolation from the approval authority</li></ul> <i>When complete, go to 3A(iii).</i>
iii) The LTM shall (see Section 3.1): <ul style="list-style-type: none"><li>• Verify isolation points on the drawing by walking down the system (not applicable if the LTM performed step 3A(i))</li><li>• Attach drawing to LTP</li></ul> <i>When complete, go to 3B(i).</i>
<b>B. Implementing a LO/TO or TO</b>
i) The LTM shall (see Section 4.2): <ul style="list-style-type: none"><li>• Appoint a trained and knowledgeable person</li></ul> <i>When complete, go to 3B(ii).</i>
ii) The trained and knowledgeable person shall (see Section 4.2): <ul style="list-style-type: none"><li>• Determine isolation point(s)</li><li>• Fill out the LTP and tag(s)</li><li>• Give the LTP and tag(s) to the LTM</li><li>• Determine if the energy isolation point(s) are capable of being locked out</li></ul> <i>If the energy isolation point(s) are capable of being locked out, go to 3B(iii). If not, go to 3C(i).</i>
iii) The LTM shall (see Section 4.2): <ul style="list-style-type: none"><li>• Ensure work has been properly authorized (COOP, POD, IWCP, etc.)</li><li>• If a TO, ensure employees involved with the TO are aware of the six tag limitations.</li><li>• Verify that the LTP and tag(s) are complete and accurate</li><li>• Ensure all potentially hazardous stored or residual energy is relieved, disconnected, restrained or otherwise rendered safe</li><li>• Appoint an isolator and verifier</li><li>• Make appropriate entries on the LO/TO Permit Log</li><li>• Inform affected employees and subcontractors of LO/TO</li><li>• Issue tag(s), lock(s), key(s), LTP and multi-lock hasps or lockbox to the isolator</li><li>• Ensure the isolator has the applicable work control document(s)</li></ul> <i>When complete, go to 3B(iv).</i>

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LO/TO Process Flowchart

<p>iv) The isolator shall (see Section 4.3):</p> <ul style="list-style-type: none"><li>• If the machine is running, ensure the equipment is shutdown per the applicable operating procedure</li><li>• Ensure residual energy has been relieved</li><li>• Position the energy isolation device(s) per the approved LTP</li><li>• If a TO, supplement the tag by at least one additional safety measure.</li><li>• As long as the system does not effect other components or release hazardous energy, physically test the equipment to ensure that the energy isolation device(s) is properly placed</li><li>• Install lock(s) and tag(s) as described by the LTP</li><li>• Physically manipulate the equipment controls</li><li>• Return the equipment controls to their original position</li><li>• If a possible electrical exposure exists, a qualified electrical worker shall use test equipment to verify electrical equipment is de-energized</li><li>• Sign and date tag(s)</li><li>• Initial, date and record time on the working copy of the LTP for each lock and tag applied</li><li>• Return key(s) and the working copy of the LTP to the LTM (<u>or</u> retain per Section 6.3)</li><li>• Initial, date and record time on the original LTP for each lock and tag applied</li></ul> <p><i>When complete, go to 3B(v).</i></p>	
<p>v) The verifier shall (see Section 4.4):</p> <ul style="list-style-type: none"><li>• Ensure that no personnel are in the area who could be affected by a failure of the isolation</li><li>• Perform an independent check (see Appendix 4) of the LO/TO or TO</li><li>• Sign and date tag(s)</li><li>• Initial, date and record time on the working copy of the LTP to indicate that each lock, tag and isolation position has been verified</li><li>• Return the working copy of the LTP to the LTM (<u>or</u> retain per Section 6.4)</li><li>• Initial, date and record time on the original copy of the LTP to indicate that each lock, tag and isolation position has been verified</li></ul> <p><i>When complete, go to 3B(v).</i></p>	
<p>vi) The LTM shall (see Section 4.2):</p> <ul style="list-style-type: none"><li>• At shift change, ensure that oncoming LTMs and affected employees are informed of the LO/TO or TO</li></ul> <p><i>When complete, go to 3C(i).</i></p>	
<p><b>C. Working Under LO/TO or TO</b></p>	
<p>i) Does this task involve testing, positioning, troubleshooting or calibrating equipment? <i>If yes, go to 3E(i). If no, go to 3C(ii).</i></p>	<p>ii) The LO/TO worker(s) shall (see Section 4.5):</p> <ul style="list-style-type: none"><li>• Verify the equipment is isolated by performing an effectiveness check</li><li>• If a possible electrical exposure exists, a qualified electrical worker shall use test equipment to verify electrical equipment is de-energized</li><li>• Install their PCL (green) on the multi-lock or lockbox hasp or install PCT if only a TO</li><li>• Perform work</li><li>• Remove PCLs or PCTs</li></ul> <p><i>When complete, go to 3E(i).</i></p>

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LO/TO Process Flowchart

<b>D. Testing, Positioning, Troubleshooting and Calibration of Equipment that are Under LO/TO or TO</b>
<p>i) The worker(s) shall (see Section 4.5 and 4.6):</p> <ul style="list-style-type: none"> <li>• Verify the equipment is isolated by performing an effectiveness check</li> <li>• If a possible electrical exposure exists, a qualified electrical worker shall use test equipment to verify electrical equipment is de-energized</li> <li>• Install their PCL (green) on the multi-lock or lockbox hasp or install PCT if only a TO</li> <li>• Perform work</li> <li>• Clear the equipment of unnecessary tools and materials</li> <li>• Remove PCLs or PCTs</li> <li>• Contact the LTM to have the isolator remove the lock(s) and tag(s)</li> </ul> <p><i>When complete, go to 3D(ii).</i></p>
<p>ii) The LTM shall (see Section 4.6):</p> <ul style="list-style-type: none"> <li>• Instruct the isolator to remove locks and tags</li> <li>• Issue additional tags to cover the testing, positioning, troubleshooting and calibration activity.</li> </ul> <p><i>When complete, go to 3D(iii).</i></p>
<p>iii) The isolator shall (see Section 4.6):</p> <ul style="list-style-type: none"> <li>• Remove the locks and tags that are necessary to allow for the testing, positioning, troubleshooting or calibration of the equipment</li> </ul> <p><i>When complete, go to 3D(iv).</i></p>
<p>iv) The LO/TO worker(s) shall (see Section 4.6):</p> <ul style="list-style-type: none"> <li>• Test, position, troubleshoot or calibrate the equipment</li> </ul> <p><i>When complete, go to 3D(v).</i></p>
<p>v) The isolator shall (see Section 4.6):</p> <ul style="list-style-type: none"> <li>• Re-apply LO/TO or TO using the same lock(s) and additional tag(s) supplied by the LTM</li> </ul> <p><i>When complete, go to 3D(vi).</i></p>
<p>vi) The verifier shall (see Section 4.6):</p> <ul style="list-style-type: none"> <li>• Ensure the LO/TO or TO has been installed correctly</li> </ul> <p><i>When complete, go to 3D(vii).</i></p>
<p>vii) Steps 3D(i) thru 3D(vi) shall be repeated until the testing, positioning, troubleshooting or calibration activities are completed (see Section 4.6).</p> <p><i>When testing, positioning, troubleshooting or calibration activities are complete, go to 3E(i).</i></p>
<b>E. Removing LO/TO or TO</b>
<p>i) The original requester shall (see Section 4.7):</p> <ul style="list-style-type: none"> <li>• Request removal of the LO/TO or TO using a LO/TO Removal Request form (see Appendix 5)</li> </ul> <p><i>When complete, go to 3E(ii).</i></p>
<p>ii) The LTM shall (see Section 4.7):</p> <ul style="list-style-type: none"> <li>• Authorize the removal of locks and tags by signing the original LTP</li> <li>• Instruct the original isolator to remove locks and tags</li> <li>• Notify affected employees that the LO/TO or TO is going to be removed</li> </ul> <p><i>When complete, go to 3E(iii).</i></p>

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LO/TO Process Flowchart

<p>iii) The isolator shall (see Section 4.7):</p> <ul style="list-style-type: none"><li>• Inspect the work area to ensure that nonessential items have been removed</li><li>• System/equipment components are intact</li><li>• Ensure affected employees have been safely positioned or removed from the area</li><li>• Remove tag(s), lock(s), key(s) and locking device(s) listed on the LTP</li><li>• Place each energy isolation device(s) in the position stated on the LO/TO Removal Request form</li><li>• Return the tag(s), lock(s), key(s), locking device(s), etc. to the LTM</li><li>• Initial, date and record the time of the removal of each lock and tag on the original LTP</li></ul> <p><i>When complete, go to 3E(iv).</i></p>	<p>iv) The LTM shall (see Section 4.7):</p> <ul style="list-style-type: none"><li>• Verify return of tag(s), lock(s), key(s), locking device(s), etc.</li><li>• Close out LTP</li><li>• Close out entry in the LO/TO Permit Log</li><li>• Destroy used tags</li><li>• Notify affected employees that the LO/TO or TO has been removed</li></ul>
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Lockout/Tagout Permit

Lockout/Tagout Permit

(For completion of this form, see the reverse side.)

1. Equipment Description: _____ L/T Permit #: _____													
2. Equipment Location: _____													
3. Reason for Lockout/Tagout _____													
4. Special Instructions _____													
5. Requester: _____													
Isolator: _____													
Verifier: _____													
6. Lockout/Tagout Information (Fill out spaces below.)													
7. Permit Completed By: _____													
Tag No.	Device Description	Device Location	Isolation Position	Lock No.	Approved By	Installed/Isolated			Verified By	Approved By	Removed		
						By	Date	Time			By	Date	Time
8. Additional Isolators and Verifiers						Additional Isolators and Verifiers							
ISOLATOR		VERIFIER		TAG#		ISOLATOR		VERIFIER		TAG#			
_____		_____		_____		_____		_____		_____			
_____		_____		_____		_____		_____		_____			
9. Special Instructions for Removal: _____													

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Lockout/Tagout Permit

Instructions for Completing This Form

THIS LTP AND TAGS WILL BE FILLED OUT BY A TRAINED AND KNOWLEDGEABLE PERSON FOR THE AFFECTED COMPONENT. THE LTM IS RESPONSIBLE FOR REVIEWING AND VERIFYING THE COMPLETENESS AND ACCURACY OF THE FORM.

1. **Equipment Description:** Equipment to be isolated. Use any descriptive reference available to the equipment to be isolated (e.g., generic name plus identifiers).
  2. **Equipment Location:** Specific location of equipment (building, room and/or column).
  3. **Reason for Lockout/Tagout:** State reason for Lockout/Tagout (e.g., maintenance, hazardous condition, sampling). List documents associated with this Lockout/Tagout, if known at the time of request (e.g., Maintenance Work Request, etc.).
  4. **Special Instructions:** List any special instructions related to the Lockout/Tagout procedure. If none are required, state none.
  5. **Requester:** Printed name of the person requesting Lockout/Tagout of a system/equipment.  
**Isolator:** Printed name of the person isolating the device/system.  
**Verifier:** Printed name of the person verifying the isolation of the device/equipment.
  6. **Lockout/Tagout Information:**  
**Tag No.:** This is the numerically sequenced number located on the upper left portion of the tag (e.g., 00001).  
**Device Description:** Description of the device being tagged (e.g., Valve 123). The description on the permit and tags should be the same as the information on the device's label plate. If no label plate is installed on the device, the function name for the device should be used (e.g., fill valve, blank flange, main breaker, etc.).  
**Device Location:** List the specific location of the device to be tagged and/or locked.  
**Isolation Position:** State isolation position.
- Lock No.:** Number of lock installed on isolation device.
- Approved by:** Signature of person in charge of the Lockout/Tagout for the affected device authorizing the individual locks and tags to be issued. For testing, positioning, troubleshooting or calibrating equipment or a process, only the initial isolation needs to be authorized on the LTP.
- Installed/Isolated By:** Initials of the trained isolator who positions the device and places locks and tags.
- Date:** Date isolation was performed (e.g., month/day/year).
- Time:** The time each isolation is complete.
- Verified by:** Initials of the trained Verifier.
- Removed by:** Initials of the trained and knowledgeable person who removes the locks and tags and positions devices as specified in LO/TO removal request.
- Date:** Date locks and tags were removed.
- Time:** Time each isolation was removed.
- Approved By:** Signature of person in charge of the LO/TO for the affected device. This signature authorizes removal, indicates concurrence with the device location specified on the LO/TO removal request, and must be signed before removal of the locks and tags. For testing, positioning, troubleshooting or calibrating equipment or a process, only the final removal needs to be authorized on the LTP.
7. **Permit Completed by:** The trained and knowledgeable person designated by the controlling organization to fill out the LTP must print his/her name in this space.
  8. **Additional Isolator(s) and Verifier(s):** Print name of any additional isolator(s), and/or verifier(s) and enter tag number.
  9. **Special Instructions for Removal:** List any special instructions or approvals necessary for Lockout/Tagout removal. If none are required, state none.

HAZARD RECOGNITION AND CONTROL

**APPENDIX 4**

**Page 1 of 2**

**Verifiers Guidelines for Testing LO/TOs**

These guidelines are for use by the verifiers only. No one else is to test Lockout/Tagouts.

**1. Tagouts Only; No locking Device Applied**

- a. If a lockout device has not been applied, do not physically test the position of the energy isolation device.
- b. Confirm by visual inspection that the non-locked energy isolation device is in the position specified by the Lockout/Tagout Permit.
- c. Verify the following, where applicable and in the order given, as indicators of position.
  - 1) The removal of the energy isolation device (example, removal of fuse or breaker).
  - 2) The presence of a physical energy isolator, such as a blank flange.
  - 3) A mechanical position indicator integral with the energy isolation device (example, mechanical position indicator of the switch handle).
  - 4) A position label and the associated position indicator (example, ON and OFF labeling on a switch and the position of the switch handle).
  - 5) The physical position of the associated operating mechanism (example, the position of the operating handle of a quarter/turn valve).
  - 6) The energy medium observed to be not present (example, visually observing that a tank is empty).
  - 7) A relevant indicator that indicates removal of the energy source (example, downstream pressure indicator or voltmeter indicating zero).

HAZARD RECOGNITION AND CONTROL

**APPENDIX 4**

**Page 2 of 2**

**Verifiers Guidelines for Testing LO/TOs**

**2. Tagouts with Lockout Applied**

A. For the following energy isolation devices that are locked out, do not physically test the position of the device; instead, perform visual inspection per 1 above:

- 1) An energy isolation device tagged out to isolate a downstream leak.

B. For lockout devices that prevent access to the positioning mechanism of the energy isolation device, perform physical testing as follows.

- 1) Attempt to gain access to position the energy isolation device; confirm that access is prevented by the lockout device.
- 2) Manipulate the lockout device without removing the lock(s) to gain maximum access to the energy isolation device; confirm that insufficient access exists to reposition the energy isolation device.
- 3) Confirm that manipulation of the lockout device does not change the position of the energy isolation device.
- 4) Verify the applicable items in 1c.

C. For lockout devices that use a restraining bar or chain, physically test as follows:

- 1) Confirm that the locking device prevents changing the position of the energy isolation device. If a locked closed valve is involved, confirm that the locking device prevents partial opening of the valve.
- 2) Verify the applicable items in 1c.

**3. Action When Verification Criteria are Not Met**

If visual inspection or physical testing reveals that an energy isolation device is not correctly positioned or that a locking device is ineffective, notify the LTM of the circumstances. Do not initial for the verification.

HAZARD RECOGNITION AND CONTROL

APPENDIX 5

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LO/TO Removal Request

LO/TO REMOVAL REQUEST

Date: \_\_\_\_\_

Permit Number: \_\_\_\_\_

Reason for Removal (initial):

LO/TO Worker  
Initials

Date

\_\_\_\_\_ Work Complete

\_\_\_\_\_ Testing

\_\_\_\_\_ Other

Tag Number

Lock Number

Device Position

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Special Instructions: \_\_\_\_\_

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Requester/Designee Signature (For Final Removal Only)

## Page 1 of 1

## Lockout/Tagout Permit Log

[illegible]